

The Coastal Storms Initiative

What Is the Coastal Storms Initiative?

The Coastal Storms Initiative is a nationwide effort led by the National Oceanic and Atmospheric Administration (NOAA) to lessen the impacts to coastal communities from storms. To accomplish this goal, local, state, and federal organizations are working together on site-specific projects.

How Will the Coastal Storms Initiative Work?

This initiative's first pilot program is under way in the St. Johns Watershed, Florida. This effort is a compilation of eight projects that address specific hazards-related issues. Taken together, the projects will result in a large suite of new and improved tools, data, information, forecast models, and training for the coastal communities in the pilot study area.

Florida pilot projects:

- Shallow Water Bathymetry for the St. Johns River
- St. Johns River Circulation Model
- Improved Oceanographic and Meteorological Observations
- Ecological Assessment of Coastal Storm Impacts
- Improved Prediction of Coastal Winds, Waves, and Flooding
- Risk and Vulnerability Assessment Tool
- Outreach and Extension
- Data Access and Standards
- Operational Inland Flood Evacuation Planning and Response Tool*

A second pilot is currently being planned in the Pacific Northwest, focusing on part of the Lower Columbia River, the southwest Washington coast, and the northwest Oregon coast. NOAA is currently working with state and local partners to identify projects for this pilot area.

What Does This Initiative Hope to Accomplish?

Currently, more than half of the population of the United States lives in the coastal zone. The Coastal Storms Initiative seeks to ensure the safety of this population and sustain the natural environment, which in turn will promote a healthy economy. This will be accomplished by developing products and services that will help local communities predict and reduce the impacts of coastal storms.

For Additional Information

For information on the Florida pilot of the Coastal Storms Initiative, contact Melissa Patterson, Melissa.Patterson@noaa.gov, (843) 740-1327. For overall information regarding the Coastal Storms Initiative, contact: Keelin Kuipers, Keelin.Kuipers@noaa.gov, (301) 713-3155, ext. 208.

*new project beginning this fall



The Coastal Storms Initiative: Shallow Water Bathymetry for the St. Johns River

New River Depth and Topography Data

Coastal mariners need to know the St. Johns River depth and bottom topography to calculate the safest route. Bathymetry is also helpful for modelers who are trying to predict flood ranges, erosion impacts, and the likely movement of hazardous spills and harmful algal blooms.

As part of the Coastal Storms Initiative, the National Oceanic and Atmospheric Administration (NOAA) Office of Coast Survey is conducting a bathymetric survey of the St. Johns River Basin, from Mayport to Palatka, to define bottom topography. The survey is currently completed from Mayport to downtown Jacksonville. When this survey is complete, the data will help ensure navigational safety through updated critical nautical charts and new information for emergency response organizations to use in the wake of a marine casualty or coastal storm. When incorporated into the modeling efforts of the Coastal Storms Initiative, these data will help provide timely and accurate water level, current, and other forecasts.

Where the Project Is Now

Data acquisition will be complete by approximately the end of 2004. As the survey progresses, preliminary data for completed areas are available upon request from David Elliott at (904) 284-0848. Survey data will be processed in a geographic information system (GIS), making the data easy for many different organizations to use. After processing, verified data will be made available to all interested federal, state, and local organizations. These final data, usually available one year after the survey, may be requested by calling George Myers, at the Hydrographic Surveys Division, (301) 713-2705. Nautical charts may be ordered from the Distribution Division by calling (800) 638-8972. Other products and services are offered at www.nauticalcharts.gov.

For Additional Information

Brian Link
NOAA Office of Coast Survey
Navigation Services Division
Telephone: (231) 759-1252
E-mail: Brian.Link@noaa.gov



The Coastal Storms Initiative: St. Johns River Circulation Model

Real-time and Forecast River Conditions

Coastal and emergency managers need to know actual and forecasted river conditions to effectively plan for, evacuate from, and respond to coastal flooding and storm surge. As part of the Coastal Storms Initiative, the National Oceanic and Atmospheric Administration (NOAA) Office of Coast Survey has applied a circulation model to the St. Johns River that was originally developed by the St. Johns River Water Management District. This model provides the actual and forecasted river and estuarine conditions, including information on water levels, currents, temperature, and salinity from the river's entrance at Mayport south to Buffalo Bluff. The routine information from this forecast system is critical for maintaining safe and efficient marine navigation.

Storm events in the St. John's River region increase the risk of hazardous materials being released from land-based facilities. Hazardous materials in transit also are at risk. To address these risks, computer-based trajectory analysis tools have been developed to provide the response and planning community with a means to test hazardous materials release scenarios in the marine environment and evaluate associated vulnerabilities.

Where the Project Is Now

An experimental version of the circulation model-based nowcast/forecast system is now being tested. It provides river conditions every hour and provides 36-hour forecasts of river conditions four times a day. Routine results will be available via the Internet in 2003. One product is the time series graphs of water levels, currents, temperature, and salinity for the area covered by the model. Another map-based product will highlight differing water levels for the river for two time periods. The St. Johns River Forecast System will be formally operational in two to three years. The circulation model makes use of updated shallow water bathymetry, real-time operational observations (including water level, temperature and salinity, meteorological, and river gauge data), boundary conditions from coastal ocean models, fresh water inputs from watershed forecast models, and operational weather forecast models.

For Additional Information

Frank Aikman
NOAA Office of Coast Survey
Telephone: (301) 713-2809, ext.101
E-mail: Frank.Aikman@noaa.gov



The Coastal Storms Initiative: Improved Oceanographic and Meteorological Observations

Comprehensive Data Now On-Line

Increasing coastal populations mean increasing numbers of people are at risk during coastal storms. To accurately forecast storm-related impacts and warn vulnerable populations, marine forecasters and coastal managers need real-time access to reliable, standardized oceanographic and meteorological observations.

Three existing oceanographic and meteorological networks operate in the pilot region, but these networks do not provide consistent and adequate marine forecasting data. As part of the Coastal Storms Initiative, the three groups responsible for the networks (the National Weather Service National Data Buoy Center, the National Ocean Service Center for Operational Oceanographic Products and Services, and the State of Florida Department of Environmental Protection) are working together to standardize and integrate their efforts. This enhanced network will provide improved wind, barometric pressure, air temperature, water level, water current, and water temperature and conductivity measurements. By working together, the enhancements lay the foundation for an improved environmental monitoring and warning system for Northeast Florida.

Where the Project Is Now

During the first year, a new data buoy was deployed off the northeast coast of Florida. The buoy provided marine observations not previously available. Information on ocean winds and wave heights assists mariners and allows forecasters to provide advanced warnings of weather hazards. These buoy data are currently available through the National Data Buoy Center Web site at www.ndbc.noaa.gov, through the Dial-A-Buoy program, and as an integrated piece of local weather forecasts.

This year, sensor installations and upgrades are being completed, as well as a series of current meter deployments on the St. Johns River. The third year will see the new and improved observational network in place. Because observational data will be obtained from common measurement systems, users will be able to compare and apply information easily for surveying and mapping purposes, and will no longer have to go to separate data centers to retrieve information. The real-time quality-controlled data will be available in a consistent, user-friendly manner via the Internet.

For Additional Information

Steve Gill
NOAA National Ocean Service
Center for Operational Oceanographic Products and Services
Telephone: (301) 713-2981, ext. 139
E-mail: Stephen.Gill@noaa.gov



The Coastal Storms Initiative: Ecological Assessment of Storm Impacts on Marine Resources

Hidden Impacts of Coastal Storms

Storm water runoff from golf courses, lawns, farm operations, urbanization, and other pollution sources may intensify during coastal storms. The associated flooding may carry contaminants, adversely affecting estuarine water quality, and often closing shellfish beds and tourist beaches.

As part of the Coastal Storms Initiative, the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service and National Ocean Service are providing coastal communities with an ecological impact assessment tool to assess and mitigate impacts from contaminants dispersed during coastal storm events. The project is identifying geographic locations and aquatic species at risk following large coastal storms. It is also investigating how contaminants move from point and nonpoint pollution sources and change the concentrations of chemical contaminants in estuarine ecosystems. After evaluating how contaminants affect natural resources, potential mitigation strategies will be identified.

Where the Project Is Now

A land-use based risk assessment is being conducted to identify likely toxic contaminants. So far, approximately 170 pesticides used in agricultural, residential, and commercial applications have been identified within the watershed. A risk assessment database was developed that provides information on amounts and locations applied, known toxicology, and chemical characteristics that affect transport and fate. This database will be made available via the Internet within the upcoming year.

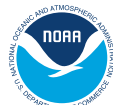
This risk assessment approach identified three chemicals that pose significant hazards and can occur at high levels in the St. Johns River and its tributaries after heavy rains. To identify how sensitive fish and invertebrates are to these chemicals, standardized methodologies were developed for conducting toxicology tests. Because fish's early life stages are most sensitive and because reductions in larval fish will ultimately affect adult populations, special attention was given to assessing contaminant impacts on these stages. Fact sheets for the three pesticides of largest concern were developed. The fact sheets summarize the known risk information including, where and at what level these chemicals are applied within the watershed. Along with the toxicology studies, analyses are being conducted to identify geographic locations where the greatest chemical risks occur. Recommendations for reducing those risks will be provided.

For Additional Information

Tom Siewicki (lead)
NOAA National Ocean Service
National Centers for Coastal Ocean Science
Telephone: (843) 762-8508
E-mail: Tom.Siewicki@noaa.gov

Tracy K. Collier
NOAA National Marine Fisheries Service
Telephone: (206) 860-3312
E-mail: Tracy.K.Collier@noaa.gov

Mary Baker
NOAA National Ocean Service
Office of Response and Restoration
Telephone: (206) 526-6315
Email: Mary.Baker@noaa.gov



The Coastal Storms Initiative: Improved Prediction of Coastal Winds, Waves, and Flooding

New Weather Models to Enhance Forecasts and Warnings

Recreational and professional mariners need wind (ocean and land breezes), wave, and visibility forecasts that are more accurate than those currently available. Emergency managers and planners need more accurate storm surge data and flood forecast information to anticipate and mitigate storm and hurricane impacts and prepare evacuation plans.

As part of the Coastal Storms Initiative, the National Oceanic and Atmospheric Administration (NOAA) National Weather Service will produce accurate and detailed weather and marine forecasts of coastal winds, waves, precipitation, and potential flooding. High-resolution computer models will examine the pilot project area in northern Florida. This project will also produce high-resolution forecasts of nearshore wave heights. An integrated flood mapping product will combine flood forecasts from NWS (river and storm surge) with estuary water level forecasts from the National Ocean Service. This information will greatly enhance weather forecasts and storm-surge predictions, which in turn will result in saved lives and property.

Where the Project Is Now

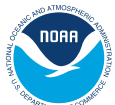
Scientists from the National Weather Service installed a new high-resolution model at the weather forecast office in Jacksonville. The new model is producing 24-hour forecasts four times a day that predict atmospheric variables such as winds, precipitation, and marine visibility. This model is already being used to produce better local forecasts. A second model is being developed to forecast waves in nearshore areas. Taken together, these new models will help forecasters produce new graphic-based forecast products.

To improve flood forecasting, the six new hydrologic forecast points along the St. Johns river will be developed by the NWS Advanced Hydrologic Prediction Service. By combining the hydrologic forecast data with NOS estuary water level forecasts and NWS storm surge forecasts, this project will produce a map-based product that highlights forecasted flood heights that are easily understandable and quickly referenced.

For Additional Information

Jeffrey Savadel (lead)
NOAA National Weather Service
Telephone: (301) 713-3557, ext. 184
E-mail: Jeffrey.Savadel@noaa.gov

Paul Hirschberg
NOAA National Weather Service
Telephone: (301) 713-3557, ext. 169
E-mail: Paul.Hirschberg@noaa.gov



The Coastal Storms Initiative: Risk and Vulnerability Assessment Tool

Helping Communities Visualize Risk

Communities need to be able to identify their risks and vulnerabilities to coastal storms to create effective hazard mitigation plans and lessen storm impacts. As part of the Coastal Storms Initiative, the National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center is working with Brevard and Volusia counties in Florida to develop an on-line spatial analysis tool for conducting risk and vulnerability assessments. By engaging community officials in the development of the tool, and by integrating real-time data and information from the other Coastal Storms Initiative projects, NOAA is striving to ensure that communities are equipped with the right information in the right format to improve their ability to plan for, respond to, and recover from coastal storms. Since these tools will be available through the Internet, individual citizens can be better informed about the potential impacts of coastal storms. A knowledgeable citizenry can work with local officials to make more informed decisions related to coastal storms, including the implementation of effective hazard mitigation measures.

Where the Project Is Now

In addition to serving as a planning and decision-support tool for emergency and coastal zone managers, the tool will also educate residents, businesses, and tourists about potential coastal storm impacts within their area. Through the tool's interactive map, a homeowner, for instance, is able to find out how vulnerable his or her property is to coastal storm-related hazards, such as hurricane storm surge, inland flooding, coastal erosion, and hurricane winds. The tool will also provide the public with more detailed information about the potential impacts associated with each hazard, including a 3-D model simulation of hurricane storm surge for several locations within each county. The project team is also working to incorporate real-time hazard forecast data, such as flood forecast information from the National Weather Service Southeast River Forecast Center, into the prototype assessment tool. The final on-line Risk and Vulnerability Assessment Tool will be completed by September 2003.

For Additional Information

Russell Jackson
NOAA National Ocean Service
Coastal Services Center
Telephone: (843) 740-1188
E-mail: Russell.Jackson@noaa.gov



The Coastal Storms Initiative: Outreach and Extension

The Human Component in Helping Communities

While technology and information is becoming increasingly vital to most coastal resource management efforts, the human component of community issues and solutions cannot be overlooked.

An important part of the Coastal Storms Initiative is the outreach and extension project, which is being spearheaded by the National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center. This project will provide the training and assistance that is necessary to help the different local project partners take full advantage of the tools and information being developed through the Coastal Storms Initiative.

Reaching out to Florida constituents while the initiative is under development and throughout the life of the pilot project life is another responsibility for the outreach and extension effort. By working to engage end users in the Coastal Storms Initiative, the NOAA Coastal Services Center is helping to ensure the ultimate success of this effort.

Where the Project Is Now

Through Florida Sea Grant, this project has provided a regional pilot coordinator, Don Jackson, who is conducting constituent meetings, developing an outreach and extension network, and identifying any needed training and technical assistance.

One such training, a hazardous materials planning workshop, was conducted by the National Ocean Service Office of Response and Restoration. This workshop identified the locations and types of facilities that store or use materials which could be hazardous to human health if released during an accident or coastal storm. Workshop information and scenarios were incorporated into a computer-based management tool (CAMEO) and then used to train first responders. The workshop also resulted in an updated hazardous materials response plan for the pilot area.

Specifically, this project is aiding other Coastal Storms Initiative projects by planning meetings, engaging the community, and providing project leads with community feedback. Taken together, these activities will help broaden the partners' understanding of local coastal issues while expanding partnerships and facilitating the implementation of other Coastal Storms Initiative projects.

For Additional Information

Melissa Patterson
NOAA National Ocean Service
Coastal Services Center
Telephone: (843) 740-1327
E-mail: Melissa.Patterson@noaa.gov



The Coastal Storms Initiative: Inland Flood Evacuation Planning and Response Tool

Helping Emergency Managers Respond to Floods

In the last 33 years, 82 percent of deaths in the U.S. caused by tropical cyclones have been due to flooding. Emergency managers need real-time access to the best available information related to current and projected flood impacts to help reduce these tragic consequences. Inland flooding, as opposed to storm surge, has been responsible for 59 percent of flood-related deaths, and 63 percent of these deaths have occurred in inland counties.

As part of the Coastal Storms Initiative, the National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center is partnering with the Federal Emergency Management Agency (FEMA), the U.S. Army Corps of Engineers (USACE) and the NOAA National Weather Service (NWS) to develop an operational inland flood evacuation planning and response tool to address the needs of federal, state, and local emergency management agencies related to inland flooding,

How the Project Will Work

In 1988, FEMA, USACE, and NWS developed the HURREVAC Model, a computer program used by many federal, state, and local government emergency managers to track hurricanes to assist in evacuation decision making for their communities. The HURREVAC Model currently has over 2,600 registered government users in the Atlantic, Caribbean, and Western Pacific regions, and it is the number one tool used by emergency managers for tracking and responding to tropical systems.

Through this project, an Inland Flooding Operational Module of the existing HURREVAC Model will be developed. The tool will enable emergency managers to access real-time flood related information in textual and graphical formats, such as current rainfall estimates, rainfall forecasts, current and forecasted river stages, general flood alerts, and information on historical flood impacts. The end product will be an operational module for two hurricane-prone states, Florida and North Carolina, and will be made available to all HURREVAC users. The module will be completed by the 2004 Atlantic hurricane season. After completion of the module, a testing period will be used to evaluate the potential of expansion to include all U.S. coastal states and territories.

For Additional Information

Russell Jackson
NOAA National Ocean Service
Coastal Services Center
Telephone: (843) 740-1188
E-mail: Russell.Jackson@noaa.gov



The Coastal Storms Initiative: Data Access and Standards

Making Coastal Ocean and Weather Data Widely Accessible in a User-Friendly Environment

Coastal ocean and weather observations are critically important to coastal communities since these observations are needed for timely and accurate weather forecasts, for developing community plans for storm preparation and response, and to mitigate effects of future events. Despite their importance, these observations are collected by a variety of organizations and are largely not available in a user-friendly format useful to multiple organizations.

As part of the Coastal Storms Initiative, the National Oceanic and Atmospheric Administration is working to identify, collect, reformat, and document coastal ocean and weather observations. This project will then provide "first stop shopping" for coastal data and information and develop a metadata catalogue to help users find relevant data. Existing observations will be better utilized by making them available in a timely, user-friendly, and understandable way.

Where Are We Now?

To increase the amount of data available to forecasters and community decision makers to support accurate forecasts and response scenarios, new and qualified data sources are being made available to National Weather Service forecasters. Rapid access to real-time observations, analyses, and forecasts will save time and effort during the critical period immediately before, during, and after a storm event.

To make a wide range of coastal data and information available in a readily accessible and unified manner, this project is currently developing a user interface to provide improved on-line access to hazards data that will help coastal managers adopt well-informed and cost-effective mitigation measures.

For Additional Information

Judy Gray (co-lead)
NOAA Office of Oceanic and Atmospheric Research
Atlantic Oceanographic and Meteorological Laboratory
Telephone: (305) 361-4306
E-mail: Judy.Gray@noaa.gov

Russ Beard (co-lead)
NOAA National Environmental Satellite Data and Information Service
National Coastal Data Development Center
Telephone: (226) 688-3026
E-mail: Russ.Beard@noaa.gov



Coastal Storms Initiative Contact List

Florida Pilot Project

Shallow Water Bathymetry

Brian Link
NOAA Office of Coast Survey
Navigation Services Division
Telephone: (231) 759-1252
E-mail: Brian.Link@noaa.gov

St. Johns River Circulation Model

Frank Aikman
NOAA Office of Coast Survey
Telephone: (301) 713-2809, ext. 101
E-mail: Frank.Aikman@noaa.gov

Improved Oceanographic and Meteorological Observations

Steve Gill
NOAA National Ocean Service
Center for Operational Oceanographic
Products and Services
Telephone: (301) 713-2981, ext. 139
E-mail: Stephen.Gill@noaa.gov

Ecological Assessment of Storm Impacts on Marine Resources

Tom Siewicki (lead)
NOAA National Ocean Service
National Centers for Coastal Ocean Science
Telephone: (843) 762-8508
E-mail: Tom.Siewicki@noaa.gov

Improved Prediction of Coastal Winds, Waves, and Flooding

Jeffrey Savadel (lead)
NOAA National Weather Service
Telephone: (301) 713-3557, ext. 184
E-mail: Jeffrey.Savadel@noaa.gov

Risk and Vulnerability Assessment Tool Operational Inland Flood Evacuation Planning and Response Tool*

Russell Jackson
NOAA National Ocean Service
Coastal Services Center
Telephone: (843) 740-1188
E-mail: Russell.Jackson@noaa.gov

Outreach and Extension

Melissa Patterson
NOAA National Ocean Service
Coastal Services Center
Telephone: (843) 740-1327
E-mail: Melissa.Patterson@noaa.gov

Data Access and Standards

Judy Gray (co-lead)
NOAA Office of Oceanic and
Atmospheric Research
Atlantic Oceanographic and
Meteorological Laboratory
Telephone: (305) 361-4306
E-mail: Judy.Gray@noaa.gov

Russ Beard (co-lead)
NOAA National Environmental Satellite, Data,
and Information Service
National Coastal Data Development Center
Telephone: (226) 688-3026
E-mail: Russ.Beard@noaa.gov

Coastal Storms Initiative Coordinator Pacific Northwest Pilot Coordinator

Keelin Kuipers
NOAA Office of Ocean and Coastal
Resource Management
NOAA Coastal Services Center
Telephone: (301) 713-3155, ext. 208

*new project beginning this fall

